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COUNTRY REPORTS

Progress of surveying and mapping in China during 1993-1997

Paper submitted by China

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This paper introduces China's government agency in charge of surveying and mapping, and the progress of surveying and mapping made since 1993, mainly in the fields of geodetic survey, cartography, GIS, legislation, education, and international cooperation.

I. CHINA'S NATIONAL SURVEYING AND MAPPING AGENCY

The National Bureau of Surveying and Mapping of China (NBSM), as the central government agency for surveying and mapping, is responsible for:

a) Formulating principles, policies, plans and development strategies of surveying and mapping work;
b) Implementing national basic surveying and mapping and cadastral surveying and mapping;
c) Formulating laws and regulations of surveying and mapping, formulating and managing surveying and mapping standards, and setting up the national surveying and mapping datums and system;
d) Managing the nation's geographical data;
e) Map compilation and publication;
f) Verifying surveying and mapping qualification;
g) International cooperation in surveying and mapping.

There are some sub-institutions under NBSM which are shown in the following chart:

NBSM

- Shaanxi Bureau of Surveying and Mapping
- Sichuan Bureau of Surveying and Mapping
- Heilongjiang Bureau of Surveying and Mapping
- Hainan Bureau of Surveying and Mapping
- National Geomatics Center of China
- Chinese Academy of Surveying and Mapping
- China Cartographic Publishing House
- Wuhan Technical University of Surveying and Mapping
- Zhengzhou Technical School of Surveying and Mapping
- China Surveying and Mapping News
- China Siwei Surveying and Mapping Technology Corporation
- Wuxi Training Center
- Other 26 Surveying and Mapping Bureaus at provincial level

II. GEODETIC SURVEY

a. Establishment of GPS networks

China's GPS networks construction started in 1991, which are composed of A order network, B order network, regional C order and D order networks. There are 28 points in A order network. with a precision of 10-8 which were measured in 1992 and remeasured in 1996. The B order network contains 754 points, the measurement of which was completed in 1995. The data processing will be finished in 1997. The C order and D order networks are measured and used according to the needs of the localities.

b. Leveling

China has established four orders leveling networks. The first order level network extends as long as 90,000 kilometers. The second phase releveling of it is planned to be completed before 1998. The data of the network can be used for China's crustal movement studies. The second order leveling network is mainly in the central and eastern part of China, which is 150,000 kilometers long.

c. Gravity measurement

China's gravity networks are divided into three grades, which are basic gravimetric points, primary gravimetric points and second grade gravimetric points. The basic and primary gravimetric points comprise the national gravimetric points. There are 27 basic gravimetric points and 80 primary gravimetric points in China.

III. GIS DATABASES

a. 1:1,000,000 database

China's 1:1,000,000 database was constructed from 1984 and completed in 1992. A cooperation project with ESRI company of the United States has started to produce compact disk of the database and it will be published in 1997.

b. 1:250,000 database

The construction of the 1:250,000 database was started in April 1996. The data acquisition will be finished by the end of 1997 and the whole database will be completed in June 1998.

c. 1:50,000 database

The 1:50,000 database, which contains topographic data and geographic name data, was designed in 1996. In 1997 the database will begin its trial production.

d. Databases at provincial level

The databases at provincial level are constructed by the provinces themselves. Some provinces are considering the construction of the local 1:10,000 database in conjunction with the updating of the provincial

1:10,000 topographic maps. NBSM will give supports to the construction of databases at provincial level so as to make them compatible with the 1:1,000,000 and 1:250,000 databases.

e. City databases
City databases have been developed very rapidly in recent years, especially in the southeast part of China. An efficient way taken for the development is to combine the development or updating of city topographic maps and the city databases' construction. The software for city database construction is chosen according to the individual needs of the cities and each database contains different types of information.

IV. TOPOGRAPHIC MAPPING

a. 1:50,000 mapping
1:50,000 topographic maps are the basic national topographic maps in China, with 24,000 sheets covering the whole country. There are over 18,000 sheets at present. NBSM planned to update the 1:50,000 topographic maps with the reference of Xian Geodetic Coordinate System 1980 and National Height Datum 1985. Up till now, 6,000 sheets have been updated.

b. 1:10,000 mapping
1:10,000 topographic maps are the basic provincial maps. There are now 150,000 sheets covering 37% of the areas of China. Each province is responsible for the updating of its own 1:10,000 maps. Many provinces have already started the work of updating their provincial maps.

V. LEGISLATION

China has developed its legislative system framework in surveying and mapping at three levels. The National People's Congress and its Standing Committee are responsible for the promulgation of national surveying and mapping laws, the State council and the provincial People's Congress are responsible for the promulgation of national and provincial regulations of surveying and mapping, and the related ministries and provincial governments are responsible for the promulgation of administrative and local surveying and mapping stipulations. The Surveying and Mapping Law, which is the first of its kind in China, was promulgated in 1992 and came into effect from 1993. The law provides the guidelines for surveying and mapping activities and management and the basis for formulating surveying and mapping regulations and stipulations.

According to the Surveying and Mapping Law, the State Council promulgated two surveying and mapping regulations, which are: the Regulations for the Management of Map Compilation and Publication of the People's Republic of China, Regulations for Protection of Surveying and Mapping Markers of the People's Republic of China. The NBSM has also formulated a series of stipulations in accordance with the Surveying and Mapping Law,, for example: the Stipulations for the Management of the Verification of Surveying and Mapping Qualification, the Standards fo Pricing of Surveying and Mapping Products, the Stipulations for the

Management of Surveying and Mapping Operation License, the Provisional Procedures for Surveying and Mapping Market, the Sample Texts of Surveying and Mapping Contract, and etc.. The regulations are conducive to standardizing the surveying and mapping market, setting up the mechanism of fair competition and promoting the healthy development of surveying and mapping market.

The promulgation of all the law and regulations marked the establishment of legislation framework of surveying and mapping in China, and has put the development of surveying and mapping into legal track. This will further promote the development and restructuring of China's surveying and mapping.

VI. EDUCATION

In China, there are two higher learning institutions and one technical school specializing in surveying and mapping which are Wuhan Technical University of Surveying and Mapping (WTUSM) , Zhengzhou Military College of Surveying and Mapping, and Zhengzhou Surveying and Mapping School. Besides, more than forty universities and technical schools offer surveying and mapping courses. Thousands of students specializing in surveying and mapping are graduated each year.

Continuous education in surveying and mapping is also valued high in China. In the past 4 years over 30,000 professional in the field of surveying and mapping have been trained in various kinds of training classes.

VII. INTERNATIONAL COOPERATION

NBSM has expanded its international cooperation in the past few years. Until now, NBSM has signed different kinds of agreements and protocols on surveying and mapping cooperation and exchange with departments of over 20 countries, and maintains friendly relations with more than 50 countries in the world. Hundreds of people are sent abroad and many visitors are received each year. A company named China Siwei Surveying and Mapping Technology Corporation was established in 1992 to serve as the window of NBSM to the outside world. NBSM actively participates in the international surveying and mapping activities. It hosted with great success the 13th United Nations Regional Cartographic Conference for Asia and the Pacific, and other conferences and symposia for international organizations such as FIG, IAC, ICA and ISPRS.